

HORSESHOE BEND WATER SUPPLY, PWS #4080024 SOURCE WATER ASSESSMENT REPORT

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State of Idaho Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the watershed characteristics.

This report, *Source Water Assessment for Horseshoe Bend Water Supply, Idaho*, describes the public drinking water system, the zone boundary of water contribution, and the associated potential contaminant sources located within these boundary. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Horseshoe Bend drinking water system consists of two surface water intake structures along the Payette River.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Due to the fairly short time associated with the movement of surface waters, source water protection activities should be aimed at short-term management strategies with the development of long-term management strategies to counter any future contamination threats. Source water protection activities should be coordinated with the communities of Banks, Crouch/Garden Valley, the U.S. Forest Service and other federal, state and local agencies.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact your regional IDEQ office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR HORSESHOE BEND WATER SUPPLY

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area, map showing the entire watershed contributing to the delineated area, a map showing the twenty-four (24) hour emergency response delineation, and the inventory of significant potential sources of contamination identified within the delineated area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

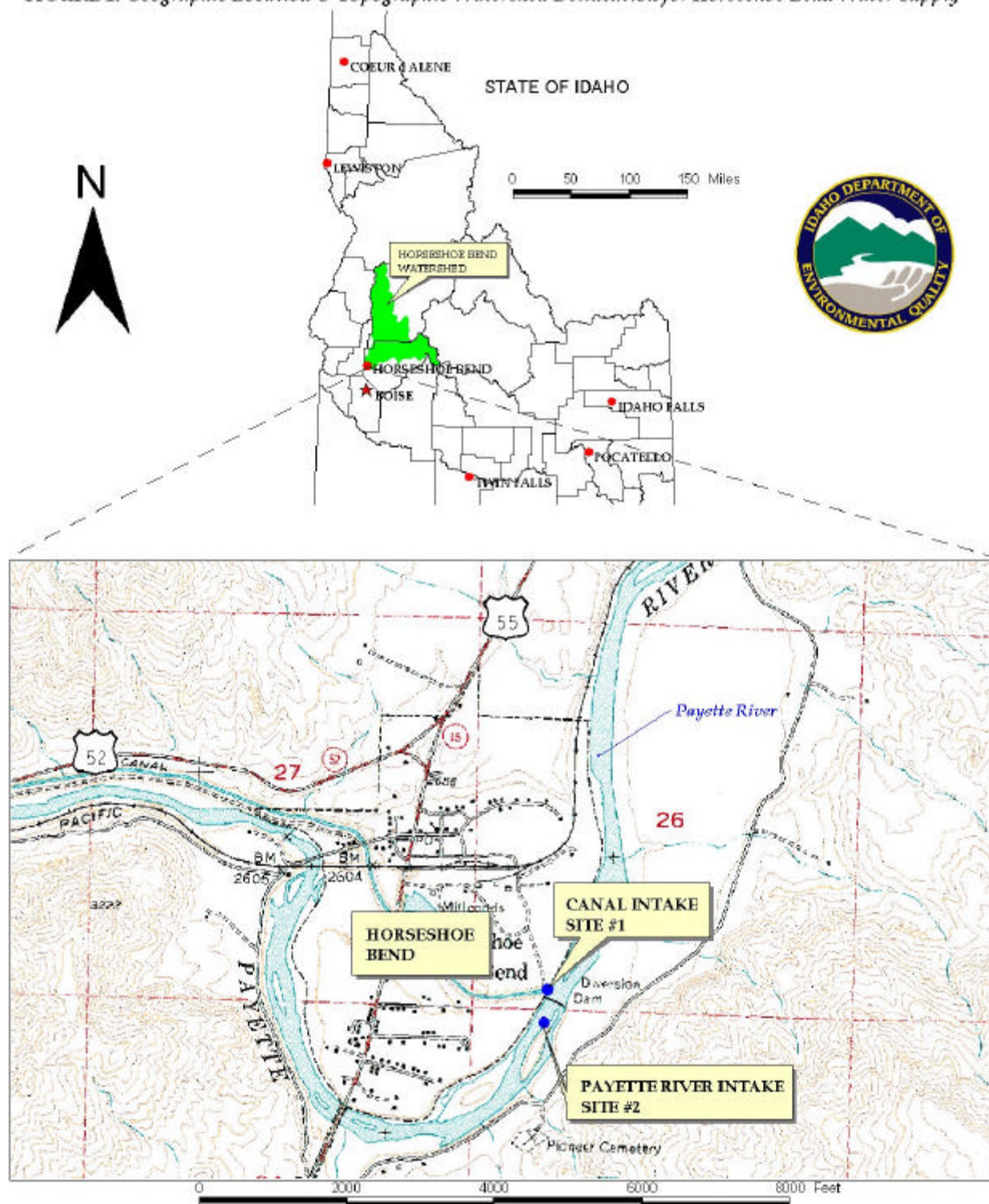
Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the intakes and watershed characteristics.

Level of Accuracy and Purpose of the Assessment

There are over 2,900 public water sources in Idaho, that must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (IDEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. IDEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

FIGURE 1. Geographic Location & Topographic Watershed Delineation for Horseshoe Bend Water Supply



Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Horseshoe Bend Water Supply serves the community of Horseshoe Bend, Idaho that consists of approximately 643 people. Horseshoe Bend is located along the Payette River approximately 23 miles Northwest of Boise (Figure 1). The public drinking water system for Horseshoe Bend is comprised of two drinking water intakes. Site #1 is located in the Idaho Power Canal and Site 2 is located in the Payette River. Average production yields 250,000 gallons per day.

The primary water quality issue currently facing Horseshoe Bend Water Supply and most surface water systems is that of possible bacterial contamination and the problems associated with managing it.

Defining the Zones of Contribution--Delineation

To protect surface water systems from such potential contaminant pathways, the EPA required that the entire drainage basin be delineated upstream from the intake to the hydrologic boundary of the drainage basin (U.S. EPA, 1997b). The EPA recognized that an intake on a large water body could have an extensive drainage basin. Therefore, the EPA recommended that large drainage basins be segmented into smaller areas for the purpose of implementing a cost-effective potential contaminant inventory and susceptibility analysis. The delineation process established the physical area around an intake that became the focal point of the assessment. The process included mapping the boundaries of the zone of contribution into a river buffer zone that extends from the intake upstream 25 miles or to the 4-hour streamflow time-of-travel boundary, whichever is greater. This buffer zone also extends up tributaries to the remainder of the 25-mile boundary or the 4-hour time-of-travel boundary. This time-of-travel boundary is based on gauge station information. This time-of-travel delineation is illustrated in Figure 2.

The delineated source water assessment area for Horseshoe Bend Water Supply can best be described as a buffered area, 500 feet on either side of the river, extends upstream 25 miles, including stream reaches within the area and extending up the Middle Fork area near Crouch. The delineated area consists of approximately 26,587 acres. The actual data used by IDEQ in determining the source water assessment delineation is available upon request.

A delineation of the watershed and stream segments encompassed by a twenty-four hour time of travel was also produced to provide system operators with a map for emergency response purposes. This map would allow the operators to be aware of the roads, railroads, and major sources of contamination that are located close to the stream network in case of a major spill which could impact their drinking water system intake. Stream velocity for time of travel estimates was calculated using the mean annual daily discharge. A 500- foot buffer on either side of major stream segments was used to identify major sources of contamination such as aboveground storage tanks, NPDES discharge sites, and RCRA facilities. This twenty-four hour emergency response delineation for the Horseshoe Bend Water Supply extends roughly 47 miles upstream, near Cascade to the North, near Lowman to the east and is illustrated in Figure 3.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of surface water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by IDEQ and from available databases.

Land use within Horseshoe Bend Water Supply source water delineated area consist predominantly range land, some irrigated agricultural land, some forested land, rural residential homes, small businesses and recreation. Homes and businesses within Horseshoe Bend Water Supply source water delineated area operate with individual septic systems.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply intake.

Contaminant Source Inventory Process

A contaminant inventory was conducted for the Horseshoe Bend Water Supply system in September, 2000. The process involved identifying and documenting potential contaminant sources within the Horseshoe Bend Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by IDEQ. A map showing the delineated area with the potential contaminant sources is included (Figure 2).

A total of 14 potential contaminant sites are located within the delineated source water area (see Table 1). Most of the potential contaminant sources within delineated source water areas are located beyond areas of immediate concern. Potential contaminant sources located within the delineated source water area for the Horseshoe Bend Water Supply include refueling stations and mine/prospect sites.

Contaminants of concern consist of volatile and synthetic organic and inorganic contaminants related to fuel tanks and mineral extraction. Table 1 lists the potential contaminants of concern and information source. It should be noted that several of the LUST (leaking underground storage tank) sites have undergone cleanup and several UST (underground storage tank) sites are closed. The sites listed as a mine are non-metallic sedimentary deposits.

Table 1. Horseshoe Bend Water Supply Potential Contaminant Inventory

SITE #	Source Description	Source of Information	Potential Contaminants
1	LUST	Database Search	VOC, SOC
2	LUST	Database Search	VOC, SOC
3	LUST	Database Search	VOC, SOC
4	UST	Database Search	VOC, SOC
5	UST	Database Search	VOC, SOC
6	UST	Database Search	VOC, SOC
7	UST	Database Search	VOC, SOC
8	MINE/PROSPECT	Database Search	IOC
9	MINE/PROSPECT	Database Search	IOC
10	MINE/PROSPECT	Database Search	IOC
11	MINE/PROSPECT	Database Search	IOC
12	MINE/PROSPECT	Database Search	IOC
13	MINE/PROSPECT	Database Search	IOC

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Analyses

The susceptibility of the source at the intakes were ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity and construction of the intake, land use characteristic, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each intake is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Intake Construction

The construction of the public water system directly affects the ability of the intake to protect the source from contaminants. The Horseshoe Bend Water Supply drinking water system consists of 2 intakes that produce surface water for domestic and industrial uses. The Canal intake (Site #1) is located near the mouth of the Idaho Power Canal and the River intake (Site #2) is located along the Payette River. Intake system construction scores were high for the Canal intake (Site #1) and moderate for the River intake (Site #2). A recent sanitary survey indicates the Canal intake (Site #1) is not properly developed but the River intake (Site #2) is properly constructed. The system does not have an infiltration gallery composed of natural material for either intake.

Potential Contaminant Source and Land Use

Both intakes rated in the low susceptibility in terms of potential contaminants overall for organic volatile and synthetic and inorganic chemicals. The system has experienced some detections of inorganic chemicals, however, none of which have exceeded the maximum contaminant levels in accordance with the Safe Drinking Water Act. The intakes rated moderate for susceptibility to microbial bacteria due to septic density. The system has not experienced any microbial bacteria detections.

In terms of the total susceptibility score, it can be seen from Table 2 that both intakes showed a moderate susceptibility score for microbial contamination, which is generally related to septic system density.

Table 2. Summary of Horseshoe Bend Water Supply Susceptibility Evaluation

Table 2. Summary of Horseshoe Bend Water Supply	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
	IOC	VOC	SOC	Microbial		IOC	VOC	SOC	Microbial
Canal Intake Site #1	L	L	L	M	H	L	L	L	M
River Intake Site #2	L	L	L	M	M	L	L	L	M

H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

H* - Indicates source automatically scored as high susceptibility due to the presence of either a VOC, SOC, or microbial bacteria in the finished drinking water

Susceptibility Summary

The Horseshoe Bend Water Supply drinking water system is low in susceptibility to inorganic, volatile and synthetic organic chemical classes and moderately susceptible to microbial contamination. Surface water systems are vulnerable to microbial contamination in general and treatment is important.

Section 3. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For Horseshoe Bend Water Supply, source water protection activities should focus on environmental education with the community, recreational users and businesses that operate within the vicinity of the delineation. Most of the delineated areas are outside the direct jurisdiction of Horseshoe Bend Water Supply. Due to the relatively short time involved with the movement of surface water, source water protection activities should be aimed at short-term management strategies with an emphasis on dealing with long-term future impacts from these same sources. Source water protection activities should be coordinated with the upstream communities, the Idaho Department of Lands, the U.S. Forest Service, and other federal, state and local agencies with lands and jurisdiction within the delineated source water area.

While the surface water sources possesses adequate quality and yield, limitations and vulnerability related to the construction of the intakes should be reviewed. An investigation of the feasibility of a shift to potential ground water sources to augment or replace the current surface water system should be considered.

Assistance

Public water supplies and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Boise Regional IDEQ Office (208) 373-0550

State IDEQ Office (208) 373-0502

Website: <http://www2.state.id.us/deq>

References Cited

EPA (U.S. Environmental Protection Agency), 1997, State Methods for Delineating Source Water Protection Areas for Surface Water Supplied Sources of Drinking Water, EPA 816-R-97-008, 40p.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997, "Recommended Standards for Water Works"

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Dept. of Environmental Quality, 1999, Idaho Source Water Assessment Plan

Howarth, Rob, 1996, Ground Water Quality Technical Report No. 7, An Evaluation of Bacteria in Ground Water Near Mountain Home, Elmore County, Idaho, Idaho Division of Environmental Quality, Southwest Idaho Regional Office

U.S. Government Printing Office, 1995, Code of Federal Regulations, 40 CFR 112, Appendix C-III, Calculation of the Planning Distance

Attachment A
Horseshoe Bend Water Supply
Susceptibility Analysis

The final scores for the susceptibility analysis were determined from the addition of the Potential Contaminant Source/Land Use Score and Source Construction Score.

Final Susceptibility Scoring:

0 - 7 Low Susceptibility

8 - 15 Moderate Susceptibility

> 16 High Susceptibility

Surface Water Susceptibility Report

Public Water System Name :

HORSESHOE BEND WATER SUPPLY

Intake#: PAYETTE UPPER CANAL, SITE #1

Public Water System Number 4080024

10/3/00 11:43:47 AM

1. System Construction

SCORE

Intake structure properly constructed

NO

1

Infiltration gallery or well
under the direct influence of Surface Water

NO

2

Total System Construction Score

3

2. Potential Contaminant Source / Land Use

IOC
ScoreVOC
ScoreSOC
ScoreMicrobial
Score

Predominant land use type (land use or cover)

BASALT FLOW, UNDEVELOPED, OTHER

0

0

0

0

Farm chemical use high

NO

0

0

0

Significant contaminant sources *

NO

Sources of class II or III contaminants or microbials present within the 500' of the intake and the

0

0

0

4

Agricultural lands within 500 feet

YES

Less than 25% Irrigated Agriculture

0

0

0

0

Three or more contaminant sources

YES

1

1

1

1

Sources of turbidity in the watershed

YES

1

1

1

1

Total Potential Contaminant Source / Land Use Score

2

2

2

10

3. Final Susceptibility Source Score

5

5

5

13

4. Final Source Ranking

Low

Low

Low

Moderate

* Special consideration due to significant contaminant sources
The source water has no special susceptibility concerns

Surface Water Susceptibility Report

Public Water System Name :

HORSESHOE BEND WATER SUPPLY
Public Water System Number 4080024

Intake: PAYETTE LOWER, RIVER, SITE #2
10/3/00 11:43:47 AM

1. System Construction

SCORE

Intake structure properly constructed

YES

0

Infiltration gallery or well
under the direct influence of Surface Water

NO

2

Total System Construction Score

2

2. Potential Contaminant Source / Land Use

IOC
ScoreVOC
ScoreSOC
ScoreMicrobial
Score

Predominant land use type (land use or cover)

BASALT FLOW, UNDEVELOPED, OTHER

0

0

0

0

Farm chemical use high

NO

0

0

0

Significant contaminant sources *

NO

Sources of class II or III contaminants or microbials present within the 500' of the intake and the

0

0

0

4

Agricultural lands within 500 feet

YES

Less than 25% Irrigated Agriculture

0

0

0

0

Three or more contaminant sources

YES

1

1

1

1

Sources of turbidity in the watershed

YES

1

1

1

1

Total Potential Contaminant Source / Land Use Score

2

2

2

10

3. Final Susceptibility Source Score

4

4

4

12

4. Final Source Ranking

Low

Low

Low

Moderate

* Special consideration due to significant contaminant sources
The source water has no special susceptibility concerns

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as **Superfund**, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of storm water runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.